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ABSTRACT

This book presents essays that offer a guide to understanding the elements necessary to bring good reading instruction to all children. It includes a list of follow-up actions accompanying each essay to assist administrators, teachers, and parents in applying this knowledge to their own instructional objectives. Essays in the book are: (1) "Overview of Reading and Literacy Research" (G. Reid Lyon); (2) "Teachers: A Key to Helping America Read" (Louisa C. Moats); (3) "Preventing Reading Failure by Ensuring Effective Reading Instruction" (Barbara R. Foorman, Jack M. Fletcher, and David J. Francis); and (4) "Comprehension: The Sine Qua Non of Reading" (Isabel L. Beck and Margaret G. McKeown). The book also provides author biographies and an explanation about the Council for Basic Education (CBE). (Each essay contains endnotes.) (CR)

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The Keys to Literacy

Council for Basic Education
1998

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The Keys to Literacy

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Table of Contents

Introduction i

Overview of Reading and Literacy Research 1
by G. Reid Lyon

Teachers: A Key to Helping America Read 16
by Louisa C. Moats

Preventing Reading Failure by Ensuring
Effective Reading Instruction 29
by Barbara R. Foorman, Jack M. Fletcher,
and David J. Francis

Comprehension: The Sine Qua Non of Reading 40
by Isabel L. Beck and Margaret G. McKeown

Follow-up Actions: What Can I Do to
Unlock the Keys to Literacy? 53

Authors' Biographies 54

About CBE 57

Introduction

It cannot be stated too often or too emphatically that the widespread illiteracy among our nation's schoolchildren is not simply a disgrace, but rises, as Reid Lyon says, to the level of a major public health problem. Learning to read is not simply one of many instructional skills — it is the skill without which little learning can take place, rendering the simplest acts of existence enormously difficult. The child who cannot read is held captive to ignorance and effectively deprived of the promise of a good life.

We at the Council for Basic Education (CBE), whose primary purpose is to promote and sustain excellent teaching in the liberal arts, are alarmed by those statistics, disclosed by the National Assessment of Educational Progress (NAEP) in 1994, which reported that 42% of fourth graders were reading at a "below basic" level. If anything is fortunate about the woeful statistics, it is that we are now directing serious attention to how children learn to read and how we can tailor reading instruction to the very young as well as to those who have fallen through the cracks in the system. We now know that reading failure can be prevented, but more important, that the timing of intervention is crucial.

For decades, reading instruction has been seen merely as an issue of whole language versus phonics. CBE believes, however, that the issue is not one of method or ideology but is about defining effective instruction. Extensive research supports instruction that relies upon teaching phonemic awareness, alphabetic decoding, word recognition, spelling, and reading comprehension. And that research clearly indicates that reading is not a natural process, like speaking, but a very complex one that needs to be carefully and systematically taught. The combination of early teaching and successful learning of phonics – the letter-sound correspondences – is essential to learning to read. But reading is not simply the ability to decode the abstract thing called a word; it is about something. Teachers, therefore, must turn to another complex process: how to comprehend what is read.

Reading research, teacher training, coherent student instruction, and the development of reading comprehension – these, then, are the four pillars of a comprehensive and sound reading program. Although the four articles we have commissioned are stylistically distinct, their authors are of one mind about what constitutes good reading

instruction. We think there is great utility in bringing them together in one publication, which can then serve as a guide to understanding how to think about and initiate effective reading instruction.

We chose these particular authors because of their national reputations as authorities, their extensive work in the field, their ability to explain complex material clearly and coherently, and their strong commitment to a literate society. G. Reid Lyon, chief of the Child Development and Behavior Branch of the National Institute of Child and Human Development (NICHD) at the National Institutes of Health (NIH), is an authority on reading development and disorders. Louisa Moats, who directs the Early Interventions Project in the District of Columbia Public Schools and the Houston Independent School District, specializes in the identification, understanding, and treatment of reading development and reading difficulty. Barbara Foorman, a professor of pediatrics and director for the Center for Academic and Reading Skills at the University of Texas-Houston Health Science Center, writes on language and reading development. Jack Fletcher, a professor in the Department of Pediatrics at the University of Texas-Houston Medical School, also writes on language and reading development, as does David Francis, professor of psychology at the University of Houston. Isabel Beck, a professor of education at the School of Education and senior scientist at the Learning Research and Development Center at the University of Pittsburgh, publishes widely in the area of reading comprehension and early reading acquisition. Margaret McKeown, a research scientist at the Learning Research and Development Center at the University of Pittsburgh, focuses her research on the study of vocabulary and its effect on reading comprehension.

To reiterate, we believe that nothing is more important than good reading skills. We have attempted to present in this publication a coherent guide to understanding the elements necessary to bring good reading instruction to all children. A list of follow-up actions accompanies the articles to assist administrators, teachers, and parents in applying this knowledge to their own instructional objectives.

Christopher T. Cross, *President*
Council for Basic Education

Overview of Reading and Literacy Research

by G. Reid Lyon

Some children learn to read and write with ease. Even before they enter school, they have developed an understanding that the letters on a page can be sounded out to make words, and some preschool children can even read words correctly that they have never seen before and comprehend what they have read. As Marilyn Adams has reported, before school and without any great effort or pressure on the part of their parents, these children pick up books, pencils, and paper and are on their way, almost as if by magic.

However, the magic of this effortless journey into the world of reading is available to only about 5% of our nation's children. It is suggested in the research literature that another 20% to 30% learn to read relatively easily once exposed to formal instruction, and it seems that youngsters in this group learn to read in any classroom, with any instructional emphasis. Unfortunately, it appears that for about 60% of our nation's children, learning to read is a much more formidable challenge, and for at least 20% to 30% of these youngsters, reading is one of the most difficult tasks that they will have to master throughout their schooling. Why is this so unfortunate? Simply, because if you do not learn to read and you live in America, you do not make it in life.

Consider that reading skill serves as the major avenue to learning about other people, about history and social studies, the language arts, science, mathematics, and the other content subjects that must be mastered in school. When children do not learn to read, their general

If you do not learn to read and you live in America, you do not make it in life.

knowledge, spelling and writing abilities, and vocabulary development suffer in kind. Within this context, reading serves as the major foundational skill for all school-based learning, and without it, the chances for academic and occupational success are limited indeed. Because of reading's importance and visibility, particularly during the primary grades, difficulty learning to read squashes the excitement and love for learning that many youngsters possess when they

enter school. It is embarrassing and even devastating to read slowly and laboriously and to demonstrate this weakness in front of peers on a daily basis.

It is clear from our National Institute of Child Health and Human Development (NICHD)-supported longitudinal studies[1] that follow good and poor readers from kindergarten into young adulthood that our young, poor readers get used to such failure. By the end of first grade, we begin to notice substantial decreases in the children's self-esteem, self-concept, and motivation to learn to read if they have not been able to master reading skills and keep up with their age-mates. As we follow the children through elementary and middle-school grades, these problems are compounded, and, in many cases very bright youngsters are unable to learn about the wonders of science, mathematics, literature, and history, because they cannot read the grade-level textbooks. By high school, these children's potential for entering college has decreased to almost nil, with few occupational and vocational choices available to them. These individuals constantly tell us that they hate to read, primarily because it is such hard work, and their reading is so slow and laborious. As one adolescent in one of our longitudinal studies remarked recently, "I would rather have a root canal than read."

While failure to learn to read adequately is much more likely among poor children, nonwhite children, and nonnative speakers of English, recent data derived from the National Assessment of Educational Progress (1994) reveal an alarming trend. In California, 59% of fourth-grade children had little or no mastery of the knowledge and skills necessary to perform reading activities at the fourth-grade level, compared with a national average of 44% below basic reading levels. Even more alarming, this evidence of serious reading failure cuts across all ethnic and socioeconomic variables. While 71% of African-Americans, 81% of Hispanics, and 23% of Asians were reading below basic levels, 44% of white students in the fourth grade were also below the basic reading level necessary to use reading as a skill. Moreover, 49% of the fourth-grade children in California reading below basic levels were from homes where the parents had graduated from college. In fact, the children of college-educated parents in California scored lowest with respect to their national cohort. These data underscore the fact that reading failure is a serious national problem and cannot simply be attributed to poverty, immigration, or

learning English as a second language. The psychological, social, and economic consequences of reading failure are legion.

It is for this reason that the National Institute of Child Health and Human Development (NICHD) within the National Institutes of Health (NIH) considers reading failure to reflect not only an educational problem, but a significant public health problem as well. Within this context, a large research network consisting of 41 research sites in North America, Europe, and Asia is working hard to identify (1) the critical environmental, the experiential, cognitive, genetic, neurobiological, and instructional conditions that foster strong reading development; (2) the risk factors that predispose youngsters to reading failure; and (3) the instructional procedures that can be applied to ameliorate reading deficits at the earliest possible time. The NICHD has supported research to understand normal reading development and reading difficulties continuously since 1963.

How Do Children Learn to Read?

Understanding how sounds are connected to print. In general, learning to read the English language is not as easy as conventional wisdom would suggest. Every type of writing system — whether it be a syllabic system as used by the Japanese, a morphosyllabic system as used by the Chinese (where a written symbol represents a unit of meaning), or an alphabetic system as used in English, Spanish, and Scandinavian languages (to name a few) — presents challenges to the beginning reader. For example, in an English alphabetic system, the individual letters on the page are abstract and meaningless in and of themselves. They must eventually be linked to equally abstract sounds, called phonemes, blended together, and pronounced as words, where meaning is finally realized. To learn to read English, the child must figure out the relationship between sounds and letters. Thus, the beginning reader must learn the connections between the 40 or so sounds of spoken English (the phonemes) and the 26 letters of the alphabet.

What our NICHD research has taught us is this: In order for a beginning reader to learn how to connect or translate printed symbols (letters and letter patterns) into sound, the would-be reader must understand that our speech can be segmented or broken into small sounds (phoneme awareness) and that the segmented units of speech

can be represented by printed forms (phonics). This understanding that written spellings systematically represent the phonemes of spoken words (termed the alphabetic principle) is absolutely necessary for the development of accurate and rapid, word reading skills.

Why is phoneme awareness so critical for the beginning reader? Because if children cannot perceive the sounds in spoken words — for example, if they cannot hear the "at" sound in "fat" and "cat" and perceive that the difference lies in the first sound — they will have difficulty decoding or sounding out words in a rapid and accurate fashion. This awareness of the sound structure of our language seems so easy and commonplace that we take it for granted. But many children do not develop phoneme awareness for some interesting reasons that we are now beginning to understand.

Unlike writing, the speech we use to communicate orally does not consist of separate sounds in words. For example, while a written word like "cat" has three letter-sound units, the ear hears only one sound, not three, when the word "cat" is spoken aloud. This merging and overlapping of sounds into a sound "bundle" makes oral communication much more efficient. Consider how long it would take to have a conversation if each word we uttered were segmented or chopped into its sound structure. In essence we would be spelling aloud the words that we were speaking. From NICHD studies undertaken to understand how the reading process develops, we now have strong evidence that it is not the ear that understands that a spoken word like "cat" is divided into three sounds and that these discrete sounds can be linked to the letters C-A-T; it is the brain that performs this function. In some youngsters, the brain seems to have an easy time processing this type of information. However, in many children, the skill is learned only with difficulty, and thus must be taught directly, explicitly, and by a well-trained, informed teacher. It has also become clear to us that the development of these critical, early reading-related skills, such as phoneme awareness and phonics, are fostered when children are read to at home during the preschool years, when they learn their letter and number names, and when they are introduced at very early ages to concepts of print and literacy activities.

Does this mean that children who have difficulty understanding that spoken words are composed of discrete individual sounds that can be linked to letters suffer from brain dysfunction or damage? Not at all. It simply means that their neural systems, which perceive the

phonemes in our language, are less efficient than in other children. This difference in neural efficiency can also be hypothesized to underlie the individual differences that we see every day in learning any skill, such as singing, playing an instrument, constructing a house, painting a portrait, and the like. Our NICHD studies have taught us that the phonological differences we see in good and poor readers have, in some cases, a genetic basis. In other children, the differences seem to be attributable to a lack of exposure to language patterns and literacy-based interactions and materials during the preschool years.

As pointed out, the development of phoneme awareness, the development of an understanding of the alphabetic principle, and the translation of these skills to the application of phonics in reading words are non-negotiable beginning reading skills that all children must master in order to understand what they read and to learn from their reading sessions. Printed letters and words are the basic data on which reading depends, and the emerging reader must be able to recognize accurately and quickly spelling patterns and their mappings to speech. But the development of phoneme awareness and phonics, while necessary, is not sufficient for learning to read the English language so that meaning can be derived from print. In addition to learning how to sound out new or unfamiliar words, the beginning reader must eventually become proficient in reading, at a very fast pace, larger units of print, such as syllable patterns, meaningful roots, suffixes, and whole words.

The development of reading fluency. While the ability to read words accurately is a necessary skill in learning to read, the speed at which this is done becomes a critical factor in ensuring that children understand what they read. As one child recently remarked, "If you don't ride a bike fast enough, you fall off." Likewise, if the reader does not recognize words quickly enough, the meaning will be lost. Although the initial stages of reading for many students require the learning of phoneme awareness and phonics principles, substantial practice of those skills, and continual application of those skills in text, fluency and automaticity in decoding and word recognition must be acquired as well.

Consider that a young reader (and even older readers, for that matter) has only so much attentional capacity and cognitive energy to devote to a particular task. If reading the words on the page is slow and labored, readers simply cannot remember what they have read,

much less relate the ideas they have read about to their own background knowledge. Children vary in the amount of practice required for fluency and automaticity in reading to occur. Some youngsters need to read a word only once to recognize it again with greater speed; others need twenty or more exposures. The average child needs between four and fourteen exposures to automatize the recognition of a new word. Therefore, in learning to read, it is vital that children read a large amount of text at their independent reading level (95% accuracy), and that the text formats provide specific practice in the skills being learned.

Constructing meaning from print. The ultimate goal of reading instruction is to enable children to understand what they read, an ability that appears to be based on several factors. Children who comprehend well seem to be able to activate their relevant background knowledge when reading — that is, they can relate what is on the page to what they already know. Good comprehenders also have good vocabularies, since it is extremely difficult to understand something you cannot define. Good comprehenders also have a knack for summarizing, predicting, and clarifying what they have read, and frequently use questions to guide their understanding. Good comprehenders are also facile in employing the sentence structure within the text to enhance their comprehension.

In general, if children can read the words on a page accurately and fluently, they will be able to construct meaning at two levels. At the first level, literal understanding is achieved. However, constructing meaning requires far more than literal comprehension. Children must eventually guide themselves through text by asking questions such as: "Why am I reading this, and how does this information relate to my reasons for doing so?" "What is the author's point of view?" "Do I understand what the author is saying and why?" "Is the text internally consistent?" It is this second level of comprehension that leads readers to reflective, purposeful understanding. The development of reading comprehension skills, like the development of phoneme awareness, phonics, and fluency, needs to be fostered by highly trained teachers.

Other factors that influence learning to read. Our research continues to converge on the following findings. Good readers are phonemically aware, understand the alphabetic principle, can apply these skills to the development and application of phonics skills when reading words, and can accomplish these applications in a fluent and accurate

manner. Given the ability to rapidly and automatically decode and recognize words, good readers bring strong vocabularies and good syntactic and grammatical skills to the reading comprehension process and actively relate what is being read to their own background knowledge via a variety of strategies. But what factors can provide a firm foundation for these skills to develop?

It is clear from research on emerging literacy that learning to read is a relatively lengthy process that begins very early in development and clearly before children enter formal schooling. Children who receive stimulating literacy experiences from birth onward appear to have an edge when it comes to vocabulary development, an understanding of the goals of reading, and an awareness of print and literacy concepts. Children who are read to frequently at very young ages become exposed in interesting and exciting ways to the sounds of our language, to the concept of rhyming, and to other word and language play that serve to provide the foundation for the development of phoneme awareness. When children are exposed to literacy activities at young ages, they begin to recognize and discriminate between letters. Without a doubt, children who have learned to recognize and print most letters as preschoolers will have less to learn upon entering school. The learning of letter names is also important because the names of many letters contain the sounds they most often represent, thus orienting youngsters early to the alphabetic principle (how letters and sounds connect). Ultimately, children's ability to understand what they read is inextricably linked to their background knowledge. Very young children who are provided opportunities to learn, think, and talk about new areas of knowledge will gain much from the reading process. With understanding comes the clear desire to read more and to read frequently, ensuring that reading practice takes place.

Why Do Some Children (and Adults) Have Difficulties Learning to Read?

Difficulties learning to read result from a combination of factors. In general, children who are most at-risk for reading failure are those who enter school with limited exposure to language and who have little prior understanding of concepts related to phonemic sensitivity, letter knowledge, print awareness, the purposes of reading, and general verbal skills, including vocabulary. Children raised in poverty, youngsters with limited proficiency in English, children with speech

and hearing impairments, and children from homes where the parents' reading levels are low are relatively predisposed to reading failure. Likewise, youngsters with subaverage intellectual capabilities have difficulties learning to read, particularly in the reading comprehension domain.

Given this general background, recent research has been able to identify and replicate findings that point to at least four factors that hinder reading development among children, irrespective of their socioeconomic level and ethnicity. These four factors include deficits in phoneme awareness and the development of the alphabetic principle (and the accurate and fluent application of these skills to textual reading), deficits in acquiring reading comprehension strategies and applying them to the reading of text, deficits in the development and maintenance of motivation to learn to read, and the inadequate preparation of teachers.

Deficits in phoneme awareness and the development of the alphabetic principle. Children who have difficulties learning to read can be readily observed. The signs of such difficulty are a labored approach to decoding or sounding out unknown or unfamiliar words and repeated misidentification of known words. Reading is hesitant and characterized by frequent starts and stops and multiple mispronunciations. If asked about the meaning of what has been read, the child frequently has little to say, not because he or she is not smart enough. In fact, many youngsters who have difficulty learning to read are bright and motivated to learn to read – at least initially. Their poor comprehension occurs because they take far too long to read the words, leaving little energy for remembering and understanding what they have read.

Unfortunately, there is no way to bypass this decoding and word recognition stage of reading. A deficiency in these skills cannot be appreciably offset by using context to figure out the pronunciation of unknown words. In essence, while one learns to read for the fundamental purpose of deriving meaning from print, the key to comprehension starts with the immediate and accurate reading of words. In fact, difficulties in decoding and word recognition are at the core of most reading difficulties. To be sure, there are some children who can read words accurately and quickly and still have difficulties comprehending, but they constitute a small portion of those with reading problems.

If the ability to gain meaning from print is dependent upon fast,

accurate, and automatic decoding and word recognition, what factors hinder the acquisition of these basic reading skills? As mentioned above, young children who have a limited exposure to both oral language and print before they enter school are at-risk for reading failure. However, many children with robust oral language experience, average to above-average intelligence and frequent interactions with books from infancy on show surprising difficulties learning to read. Why?

In contrast to good readers who understand that segmented units of speech can be linked to letters and letter patterns, poor readers have substantial difficulty developing this "alphabetic principle." The culprit appears to be a deficit in phoneme awareness – the understanding that words are made up of sound segments called phonemes. Difficulties in developing phoneme awareness can have genetic and neurobiological origins or can be attributable to a lack of exposure to language patterns and usage during the preschool years. The end result is the same, however. Children who lack phoneme awareness have difficulties linking speech sounds to letters and their decoding skills are labored and weak, resulting in extremely slow reading. This labored access to print renders comprehension impossible. Thus the purpose for reading is nullified because the children are too dysfluent to make sense out of what they read.

In studying 34,501 children over the past 33 years, we have

> *Phonemic awareness skills assessed in kindergarten and first grade serve as potent predictors of difficulties in learning to read.*

learned the following with respect to the role that phonemic awareness plays in the development of phonics skills and fluent, automatic word reading:

- Phonemic awareness skills assessed in kindergarten and first grade serve as potent predictors of difficulties in learning to read. We have learned how to measure phonemic awareness skills as early as the first semester in kindergarten with tasks that take only fifteen minutes to administer. Over the past decade we have refined these tasks so that we can predict with approximately 80% to 90%

accuracy who will become good readers and who will have difficulties learning to read.

- We have learned that the development of phonemic awareness is a necessary but not sufficient condition for learning to read. A child must integrate phonemic skills into the learning of phonics principles, must practice reading so that word recognition becomes rapid and accurate, and must learn how to actively use comprehension strategies to enhance meaning.
- We have begun to understand how genetics is involved in learning to read, and this knowledge may ultimately contribute to our prevention efforts through the assessment of family reading histories.
- We are entering very exciting frontiers in understanding how early brain development can provide a window on how reading develops. Likewise, we are conducting studies to help us understand how specific teaching methods change reading behavior and how the brain changes as reading develops.
- We have learned that just as many girls as boys have difficulties learning to read. Until five years ago, the conventional wisdom was that many more boys than girls had such difficulties. Now females should have equal access to screening and intervention programs.
- We have learned that for 90% to 95% of poor readers, prevention and early intervention programs that combine instruction in phoneme awareness, phonics, fluency development, and reading comprehension strategies, provided by well-trained teachers, can increase reading skills to average reading levels. However, we have also learned that if we delay intervention until nine years of age, the time when most children with reading difficulties receive services, approximately 75% of the children will continue to have difficulties learning to read throughout high school. To be clear, while older children and adults can be taught to read, the time and expense of doing so is enormous.

Deficits in acquiring reading comprehension strategies. Some children encounter obstacles in learning to read because they do not derive meaning from the material that they read. In the later grades, higher order comprehension skills become paramount for learning. Reading comprehension places significant demands on language comprehension

and general verbal abilities. Constraints in these areas will typically limit comprehension. In a more specific vein, deficits in reading comprehension are related to inadequate understanding of the words used in the text, inadequate background knowledge about the domains represented in the text, a lack of familiarity with the semantic and syntactic structures that can help to predict the relationships between words, a lack of knowledge about writing conventions that are used to achieve different purposes via text (such as humor, explanation and dialogue), verbal reasoning ability which enables the reader to "read between the lines," and the ability to remember verbal information.

If children are not provided early and consistent experiences that are explicitly designed to foster vocabulary development, background knowledge, the ability to detect and comprehend relationships among verbal concepts, and the ability to actively employ strategies to ensure understanding and retention of material, reading failure will occur no matter how robust word recognition skills are.

A major factor that aids or limits the amount of improvement that a child may make in reading is highly related to his or her motivation

> *It is known that successful reading development is predicated on practice in reading, and obviously the less a child practices, the less developed the various reading skills will become.*

to persist in learning to read despite difficulties. Although most children enter formal schooling with positive attitudes and expectations for success, those who encounter difficulties learning to read clearly attempt to avoid engaging in reading behavior as early as the middle of the first grade year. It is known that successful reading development is predicated on practice in reading, and obviously the less a child practices, the less developed the various reading skills will become.

Inadequate preparation of teachers. As evidence mounts that reading difficulties originate in large part from difficulties in developing phoneme awareness, phonics, reading fluency, and reading comprehension strategies, the need for informed instruction for the millions

of children with insufficient reading skills is an increasingly urgent problem. Unfortunately, several recent studies and surveys of teacher knowledge about reading development and difficulties indicate that many teachers are underprepared to teach reading. Most teachers receive little formal instruction in reading development and disorders during either undergraduate or graduate studies, with the average teacher completing only two reading courses.

Teachers who instruct youngsters who display reading difficulties must be well versed in understanding the conditions that have to be present for children to develop robust reading skills. They also must be thoroughly trained to assess and identify children at-risk for reading failure at early ages. Unfortunately, many teachers and administrators have been caught between conflicting schools of thought about how to teach reading and how to help students who are not progressing easily. In reading education, teachers are frequently presented with a "one size fits all" philosophy that emphasizes either a "whole language" or "phonics" orientation to instruction. No doubt, this parochial type of preparation places many children at continued risk for reading failure, since it is well established that no reading program should be without all the major components of reading instruction (phoneme awareness, phonics, fluency, and reading comprehension). The real question is which children need what, how, for how long, with what type of teacher, and in what type of setting.

Summary

- Learning to read is a lengthy and difficult process for many children, and success in learning to read is based in large part on developing language and literacy-related skills very early in life. A massive effort needs to be undertaken to inform parents and the educational and medical communities of the need to involve children in reading from the first days of life — to engage children in play with language through nursery rhymes, storybooks, and writing activities. Children need to experience as early as possible opportunities that help them understand the purposes of reading and the wonder and joy that can be derived from reading. Parents must become intimately aware of the importance of vocabulary development and the use of verbal interactions with their youngsters to enhance grammar, syntax, and verbal reasoning.

- Young preschool children should be encouraged to learn the letters of the alphabet, to discriminate letters from one another, to print letters, and to attempt to spell words they hear. Introducing young children to print will increase their exposure to the purposes of reading and writing, their knowledge of the conventions of print, and their awareness of print concepts.

- Reading out loud to children is a proven way to develop vocabulary growth and language expansion and plays a causal role in developing both receptive and expressive language capabilities. Reading out loud can also enhance children's background knowledge of new concepts that may appear in both oral and written language.

- Our NICHD prevention and early intervention studies in Houston, Tallahassee, Albany, Syracuse, Atlanta, Boston, Seattle, and Washington, D.C., all speak to the importance of early identification and intervention with children at-risk for reading failure. Procedures now exist to identify such children with good accuracy. This information needs to be widely disseminated to schools, teachers, and parents.

- Kindergarten programs should be designed so that all children will develop the prerequisite phonological, vocabulary, and early reading skills necessary for success in first grade. All children should acquire the ability to recognize and print both upper-case and lower-case letters with reasonable ease and accuracy, develop familiarity with the basic purposes and mechanisms of reading and writing, and develop age-appropriate language comprehension skills.

- Beginning reading programs should be constructed to ensure that adequate instructional time is allotted to the teaching of phonemic awareness skills, phonics skills, the development of reading fluency and automaticity, and the development of reading comprehension strategies. All these components of reading are necessary but not sufficient in and of themselves. For children demonstrating difficulty in learning to read, it is imperative that each of these components be taught within an integrated context and that

ample practice in reading familiar material be afforded. For some children, our research demonstrates that explicit, systematic instruction is crucial to helping them understand and apply critical phonemic, phonics, fluency, and reading comprehension skills. Even for children who seem to grasp reading concepts easily, learning to read is not a natural process; reading instruction must be thoughtful and planned and must incorporate the teaching of all the critical reading skills.

- A major impediment to serving the needs of children demonstrating difficulties learning to read is current teacher preparation practices. Many teachers lack basic knowledge about the structure of the English language, reading development, and the nature of reading difficulties. Major efforts should be undertaken to ensure that colleges of education possess the expertise and commitment to foster expertise in teachers at both preservice and inservice levels.

- The preparation of teachers and the teaching of reading in our nation's classrooms must be based upon research evidence of the highest caliber and relevance. Research used to guide policy and instructional practice should be characterized by methodological rigor and the convergence of studies demonstrated to be representative, reliable, and valid and described with sufficient clarity and specificity to permit independent replication. Moreover, we must realize that no one study should be used to guide practice. To reiterate a significant point, the research knowledge employed to guide policy and practice must inform us how different components of reading behavior are best developed by various approaches to reading instruction for children of differing backgrounds, learning characteristics, and literacy experiences.

Endnotes

[1]The National Institute of Child Health and Human Development is part of the National Institutes of Health, U.S. Department of Health and Human Services. It conducts and supports laboratory, clinical and epidemiological research on the reproductive, neurobiologic, developmental, and behavioral processes that determine and maintain the health of children, adults, families, and populations. New scientific technologies are allowing NICHD to combine studies in biology and behavior to achieve a fundamental understanding of the origins of problems and follow the course of treatment to assess how the underlying problem is corrected. Nowhere is this more dramatic than in the studies linking fundamental neurosciences and reading behavior. NICHD is now engaged in remedial interventions with a large number of children with reading disability and will be testing them after they learn to read to determine whether the treatment results in improved functioning in those brain areas that children with good reading ability use, or whether they develop alternative pathways that allow them to read. In addition, NICHD is continuing to conduct basic studies and clinical trials of reading intervention in the classroom.

Teachers: A Key to Helping America Read

by Louisa C. Moats

In 1996, the National Commission on Teaching and America's Future issued a report that advocated nothing less than this: Teacher education in America should be redesigned from beginning to end. Asserting that standards for student performance, curriculum designs, and assessment practices should be aligned, the Commission asked the nation to clarify and raise expectations for students and their teachers. It was time, said the Commission, to overhaul and rejuvenate the profession of teaching. The Commission also acknowledged that the task of setting standards for both students and teachers had been left unattended for too long. It argued that coursework must be coordinated with supervised teaching experiences; that new teachers should collaborate with experienced mentors; and that our best teachers deserve advanced certification with contingent compensation. Credentials should be given to teachers who, in addition to completing courses, can demonstrate their preparedness in both conceptual understanding of their field and in practical teaching skill.

Within this context, the reform of teacher education in reading is underway. No doubt, better preparation of teachers is a critical step in reducing the reading problems that are too prevalent in this nation. Policies that will improve the teaching of reading, however, must be based on a definition of what effective reading teachers do. The essential knowledge, skills, and abilities of good reading teachers must be defined. Then standards must be developed for which programs and individuals are accountable. The enormous gains in our understanding of reading development, proficient reading, and the causes of reading failure provide for a common set of expectations to which preparation programs can be held. What follows is a blueprint for what might be done.

Teachers Must Teach the Form and Meaning of Written Language

As research has verified, learning to read well is neither easy nor natural for the majority of children. Reading well requires proficiency in both symbolic decoding and comprehension. Decoding, however, is the essential foundation of reading, without which comprehension of

the written word will be significantly constrained. Children who learn to read well look at print and connect its patterns with sounds, syllables, and meaningful word parts quickly, accurately, and unconsciously. Skills the reading teacher must impart include the understanding that words comprise speech sounds, syllables, and meaningful parts, the recognition of these units in the spelling system, the rapid recognition of familiar words in print, knowledge of word meanings, and the application of comprehension strategies to sentences, paragraphs, and whole texts. Instruction should be based on valid assessment of students' reading abilities. In addition, the teacher must motivate students to read independently.

While such statements may seem to beg common sense, the understanding that reading is a language skill is a relatively pivotal insight of modern reading science. Older views emphasized the importance of emotional, intellectual, and perceptual factors in reading. If reading ability is explained primarily by language ability, then teachers must aim to teach language structure and substance and avoid tangents that have little impact on learning to read. These tangents include an exclusive focus on reading for enjoyment, instruction in "learning styles," coaching in strategy use before basic reading skills are learned, and various kinds of perceptual-motor exercises. Because poor processing of language structure distinguishes most poor readers, well-designed instruction in language is the most logical antidote. Effective teachers of reading will be able to shed light on every level of language organization, including sounds, syllables, morphemes, phrases, sentences, paragraphs, stories, essays, and descriptions.

As other papers in this publication discuss, language structure at the level of speech sounds allows mental mapping between speech and alphabetic writing. Children who learn vocabulary words easily and who can read "by sight" can do so because they are better at speech sound detection as well as memorization of words. Conversely, children who fall behind in reading are most likely to show deficits in phonological skill and phonic knowledge. They confuse similar speech sounds, have trouble distinguishing and remembering words that sound alike, and forget the sounds that letters represent. Teachers who know the speech sounds, the spelling code, and what typically gives children trouble can help these children with systematic teaching of the material. Teachers who succeed with the most children teach the

structure of language explicitly, beginning with sounds and letters but progressing through words, sentences, and texts as children become fluent readers.

Knowing the concepts of language structure also allows a teacher to interpret student responses and give clarifying feedback, choose what to teach next, and understand how the student is progressing through the stages of reading and spelling development. All these decisions are made every day in classrooms. None of them are possible without knowledge of the symbol system, the organization of language itself, or insight into how children learn it. For example, a student who reads *dinner* for *diner* or *neat* for *net* is less likely to repeat the errors if instruction is aimed at the source of the confusion: insufficient awareness of sounds, sound-symbol correspondence, spelling patterns (orthography), syllables, and meaningful parts of words. Without insight into these various linguistic entities, the teacher may give misinformation or word-by-word corrections after errors are made. Often they instruct the student to guess words or skip them. Such strategies do not promote independent ability to read new words accurately.

> *Learning to read for most children is more like learning to play the piano (an acquired skill) than learning to run (a natural skill).*

Similar arguments can be made for the teaching of text structure (the underlying form of a story, essay, or information piece) and its relationship to passage meaning. If students miscomprehend, the teacher should inquire why comprehension broke down. Was it background knowledge? Was it interpretation of word meanings? Was it understanding of syntax such as the passive voice? Was it the unfamiliar meanings of idioms or phrases with double meanings? Or was it failure to use a self-monitoring strategy that would have directed the child to reread for clarification? Without knowledge of language form and its relationship to meaning, such judgments are impossible.

Teaching the structure and content of language also requires knowing how to impart concepts and skills efficiently and enjoyably. Dry or dissociated drills, a justly criticized feature of some old phonics programs, are not advisable. Teachers must know how to engage students

in active exploration of the systems at work within spoken and printed language.[7] They must know how to proceed in a logical manner, teaching one or two concepts at a time, and simultaneously tying language study to meaningful reading and writing experiences. They must know their content so well that they can be enthusiastic and move at a good pace that will capture students' attention and effort.

Learning to read for most children is more like learning to play the piano (an acquired skill) than learning to run (a natural skill). It necessitates learning a symbol system, translating symbols into thoughts and actions, achieving automatic mastery of fundamentals for fluent application, and understanding of text structure. An informed teacher will present concepts accurately, assess and interpret student responses, and manage a student's progression through stages of reading development. Although such knowledge and abilities might seem reasonable to expect, few teachers are now prepared to carry out this complex task.

Why Have Teachers Been Underprepared to Teach Reading?

Minimal coursework requirements. The insufficiency of teacher preparation in reading is widely acknowledged in many states and was addressed at length in the recent report of the National Research Council on *Preventing Reading Difficulties in Young Children*.[8] The requirements for coursework in reading are minimal in teacher licensing programs.[9] Generally, one 3-credit methods course in language arts is all that is required of elementary teachers in training.[10] Special education teachers are often licensed without having to learn methods for direct, systematic, structured language teaching, even though the students they serve are most commonly reading disabled and dependent on this type of instruction.[11] In a single methods course, it is not possible for teachers in training to learn the fundamentals of reading psychology, the structure of language, children's literature, and the management of a reading program based on assessment, let alone the specific techniques for teaching. The demands of competent reading instruction have been seriously underestimated by designers of preparation programs.

Experienced teachers who are surveyed about their preparation for teaching reading are often loyal to the colleges that prepared them but critical of the training itself.[12] Many feel shortchanged by their

undergraduate and graduate programs. Many report that they seldom observed good teachers actually teaching students with diverse needs. Supervised instruction of students was seldom emphasized. Typically, new teachers are vulnerable to great frustration if their preparation has not given them the tools to accomplish the task at hand. To what can we attribute this state of affairs?

The knowledge base is not self-evident. Only a few exceptional teacher preparation programs require teachers themselves to study the language they will have to teach to children.[8] The reasons for this omission include more than the hostility of whole language ideologues to language analysis, and more than the inconvenience of adding a requirement to the roster of courses teachers must take. An underlying reason for this omission is probably the abstractness and difficulty of the information itself.

> *Only a few exceptional teacher preparation programs require teachers themselves to study the language they will have to teach to children.*

Knowledge about speech and print is used by people who read, including teachers, but is usually processed at an automatic, unconscious level. The brain is designed *not* to pay attention to the structure of language as we extract its content. Awareness of phonemes, phonics, word structure, and text organization is not part of adults' "natural" language repertoire and is not related to general intellectual ability. If adults know these concepts well, it is because they have studied and thought about them for the purpose of teaching others. Even then, misconceptions abound.

A direct survey measuring experienced teachers' ability to identify speech sounds, spelling patterns, and word structures typically reveals common confusions in teachers' perceptions of language. In general, teachers have rudimentary or cursory familiarity with concepts but do not know the details that would be necessary to give accurate information to children.[9] For example, the concept of a consonant digraph – a letter combination that represents one speech sound (ch, wh, sh, th, ng) – is unclear to a surprising number of experienced teachers. Many identify these units by rote but are unable to differentiate

conceptually between a digraph and a blend (cl, st, pr) or a silent letter spelling (kn-, wr-,-mb). Very few know common spelling patterns that correspond to pronunciation and word form, such as the reasons why consonant letters are doubled in words like *misspell, dinner,* and *accommodate.* Clearly, one level of knowledge is necessary to read the words; another, deeper level is necessary to explain pronunciation and spelling, word origins, or how spelling is related to meaning. Some children learn these concepts very easily in spite of the way we teach them, but others never learn unless they are explicitly taught. Teachers must study these concepts just as children do, but often their textbooks and instructional materials lack the information that would enable them to proceed with clarity and confidence.

Have Instructional Materials Failed?

Good information is hard to get. Among a group of popular texts for reading educators that this author recently reviewed, none contained current information about the known relationships between linguistic awareness, reading decoding, and reading comprehension. None discussed in any useful detail how English orthography represents speech. Basic concepts such as the differences between speech sounds and spellings, the fact that every syllable in English is organized around a vowel phoneme, and the existence of morphemes in the Latin layer of English (about 60% of running text) were never explained. None of these popular texts contained accurate information about phonology and its role in reading development, and none of them explained with depth or clarity why many children have trouble learning to read or what to do about it. None contained information about the linguistic features children typically confuse so that teachers could begin to interpret children's responses. Why reading educators who write textbooks do not include this information is unknown, but it is likely that they themselves may not understand its relevance.

Classroom materials have omitted essential skills. Instructional materials used by teachers have not included sufficient instruction in phoneme awareness, phonics, spelling, grammar, or comprehension strategies. When the California State Department of Education assessed the adequacy of classroom reading programs in the fall of 1996, it determined that supplementary instructional materials were needed in most districts just to provide instruction in the basic skills

of reading and writing. The most popular programs currently in use were developed in the early 1990's and were strong on literature, illustrations, cross-disciplinary thematic units, and motivational strategies for children, but very weak or simply misinformed on the structure of our language and how children actually learn to read the words on the page.

Teachers learn a great deal from the instructional materials they use, and if they are equipped with a program that is missing major components, they themselves will not learn how to teach reading. Teachers, especially novice teachers, do better if their program is structured, comprehensive, and systematic. Because materials themselves affect what teachers know and do, the publishing and purchasing of instructional materials should be contingent on standards for validity and effectiveness. We expect no less accountability for other products, such as food and drugs, that affect public well-being.

Policy Initiatives on Teacher Preparation in Reading

Along with initiatives to improve general teacher preparation and teacher performance, focus on the improvement of reading instruction has been intense in national and state forums. In states such as California, Texas, Maryland, and Illinois, legislatures have sought advice from reading researchers and appropriated funds for the improvement of reading instruction based on research findings. Laws and directives have not been adopted without dissension, however. Fierce battles have ensued between those who want rapid change driven by state initiatives and those within the field who fear loss of control over the conduct of their profession. As heated as the political battles have been, they have forced dialogue about the knowledge base for teaching reading and the best means for conveying that knowledge to teachers. Slowly, a consensus is developing that reading instruction requires a complex mix of knowledge, skills, and abilities and that our present training programs are grossly inadequate for preparing competent teachers of reading.

California has boldly ventured where none before have tread. Spurred by embarrassingly low scores on the National Assessment of Educational Progress in 1994, the California legislature unanimously adopted a series of laws between 1996 and 1997 that have come to be known as the California Reading Initiative (CRI), the most

far-reaching attempt by a state to reform the teaching of reading. The CRI included a number of components: a) use of Goals 2000 monies to promote university and school district partnerships; b) support for teacher professional development in the schools; c) provision of funds for instructional materials; d) reduction in class size in grades K-3; e) a comprehensive reading leadership program for administrators; and f) development of a Reading Instruction Competency Assessment (RICA) for new teacher candidates. Beginning in the fall of 1998, all the candidates for the general elementary teaching credential must pass either a written exam or a performance exam to demonstrate their competence in teaching reading. As the Commission began the task of developing the RICA test, however, it discovered that no job analysis of teaching reading had ever been done on a state level, and that the knowledge, skills, and abilities of reading teachers had yet to be defined.

In order to specify the basis for the Reading Instruction Competency Assessment, and thus indirectly the content of courses to prepare teachers for it, the Commission followed a series of steps. They began with a conceptual outline of professional requirements for reading;[1] conducted a survey of 4,000 reading specialists, teachers, and teacher educators; employed consultants to construct and analyze the survey; worked with a committee of experts in reading; and held public hearings for discussion of the content outline. Successful teaching of reading, they determined, requires both knowledge and practical teaching skill in all of the following:

- phonological awareness;
- concepts about print and letter recognition;
- systematic, explicit phonics and other word identification strategies;
- spelling instruction;
- vocabulary development;
- reading comprehension;
- student independent reading and its relationship to improved reading performance;

- relationships among reading, writing, and oral language;
- diagnosis of reading development;
- the use of assessments and evaluation of information; and
- the structure of the English language.

Within each of these domains, decisions were made regarding research-based practice. For example, prospective teachers are now required to know the difference between implicit and explicit teaching of language concepts, to organize spelling instruction around patterns in orthography, and to teach specific comprehension strategies. Already these requirements are pushing an otherwise recalcitrant university system into productive reorganization of programs and courses.

Because teachers can demonstrate their knowledge through a direct evaluation of classroom performance, greater emphasis must be placed on implementation of ideas into effective practice. Supervised teaching experience and collaboration with mentors is prerequisite for training, a reality that should translate into greater recognition for faculty members who actually coach teachers in school settings.

Removing Obstacles: What We Can Do Now

Base practice on research. Unfortunately, few decisions in reading education are made with reference to scientific studies of reading psychology or reading instruction. To change this state of affairs, educators must depart from ideological decision-making and trust the authority of our most credible experts in reading and related fields. They will also have to be willing to discard faddish ideas and practices that hold up poorly under objective scrutiny.[12] In the past, the research that should guide instruction has been inaccessible, of poor quality, or impractical. Reading is one of the most studied aspects of human behavior, however, and a large body of work based on sound principles of objective inquiry exists. The best studies are designed to test competing hypotheses, employ designs that allow the studies to be replicated, and yield trustworthy results obtained with methodological sophistication.[13] Several consensus documents distill the essence of this work and should be disseminated through every means available to all those responsible for teacher education.[14]

Establish core requirements and standards for new teachers. Following California's example, the knowledge and abilities important for competent delivery of balanced, comprehensive reading instruction should be defined and used for licensing and evaluation of teachers. California's blueprint is exemplary because it focuses on knowledge of language structure, the importance of aligning instruction with student characteristics, and the importance of skilled teaching behavior.

More research is necessary to differentiate between the needs of novices and experts in reading instruction. In addition, more research is needed on the best way to combine coursework and practical experience during training. For example, experience in teaching reading to one student may be the best starting point for new teachers who are honing their observational skills before undertaking the challenge of classroom management. Nevertheless, the research foundation for initial action is solid.

Accredit programs based on their ability to prepare effective teachers. Schools of education have been low on the academic totem pole in our universities. Professors are paid less, are expected to teach more courses, and are not rewarded for clinical or practical work with teachers in schools. Partnerships between schools and universities are weak or nonexistent. These conditions perpetuate programs with little cohesion or accountability, in which reading courses are often taught by adjunct faculty. When the Commission on Teacher Credentialing in California surveyed college professors responsible for teaching reading courses, 20% responded. Some professors could not be located; others were simply resistant to cooperating with any attempt to establish course standards. Nevertheless, the Commission's analysis of the survey results showed that course content had little consistency and was not aligned with the components of instruction established by research. Program accreditation in California is now governed by program standards aligned with student standards, assessment standards, and curriculum frameworks.

Are professors of education currently able to provide instruction that prospective teachers need? Although individual professors may be doing a commendable job within the constraints of their programs, many are not current in their field and are insulated from scientific progress in related fields that impact their own. Professors need opportunities and incentives to attend professional development

institutes that will keep them abreast of advances in fields such as linguistics, neuropsychology, cognitive experimental psychology, and intervention research.[15]

Promote high-quality professional development for teachers at work. Every currently employed teacher of reading needs to understand the structure of the English language, the differences between good and poor readers, the course of reading acquisition, and the importance of both decoding and comprehension processes in reading instruction. Teachers at work need professional development seminars with topical continuity, practical application, peer collaboration, and incentives for self-evaluation. States can take an active role by limiting the use of state monies to programs that meet criteria for currency and effectiveness. States, professional groups, and other agencies can promote the dissemination of research and its implications for practice. The federal government can tie grant money to working partnerships between research institutions, public schools, and teacher preparation programs, both private and public.

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Employ, promote, and compensate teachers for their knowledge and skill. The most effective teachers obtain positive, measurable results with children who are confident that they can read and who read independently. These teachers need recognition, financial reward, and positions of leadership. Conversely, teachers who year after year allow poor readers to go unidentified and unremediated should receive negative evaluations and be encouraged to seek other employment. Maintaining standards will require instructional leadership, routine monitoring of classroom teaching, ongoing assessment, and support for teachers striving to improve their practice.

Invest in teaching. Improving the climate in which teachers work will help entice and keep better candidates in our classrooms. Amenities the rest of us take for granted, such as access to telephones and copy machines, time to eat lunch or plan with colleagues, freedom from menial chores, assistance within the classroom, and access to validated instructional materials, should be available to all teachers. Most of all, however, teachers who know they can achieve results because their programs and training have equipped them for the task at hand are likely to stay in the profession and experience satisfaction from this complex, demanding job.

The fact that teachers are not born knowing how to carry out deliberate instruction in reading, spelling, and writing should not be the basis for criticism. Rather, it should underscore the obligation of training programs to give them the coursework and practice they need to reach all children for whom they are responsible. The current gaps in teacher licensing programs represent both a misunderstanding of what reading instruction demands and the mistaken notion that any literate person should be able to teach children to read. We know, however, that anyone who can sing cannot teach music and that anyone who can use scissors cannot be a surgeon. Certainly, anyone who can read cannot teach reading.

Professions such as plumbing, hairdressing, mechanics, medicine, speech/language pathology, and psychology regulate themselves through governing boards, accreditation standards for training programs, national examinations, and continuing education requirements. They also reward professional growth and excellence. When it comes to teaching reading, there is every reason to expect compliance with a self-regulating profession. Our children so often depend on the skill of teachers; they deserve no less.

Endnotes

[1]Snow, K., Burns, S., & Griffin, P. (1998). *Preventing Reading Difficulties in Young Children.* Washington, DC: National Academy Press.

[2]Discussed in greater depth in Moats, L. (1998). Teaching Decoding. *American Educator, 22,* 42-49, 95-96.

[3]Snow, Burns, & Griffin.

[4]Nolen, P.A., McCutcheon, D., & Berninger, V. (1990). Ensuring tomorrow's literacy: A shared responsibility. *Journal of Teacher Education, 41,* 63-72; Snow, Burns, & Griffin.

[5]The state of Maryland is currently proposing to raise requirements from one course to four to prepare teachers of reading.

[6]Standards for teacher training adopted by the International Multisensory Structured Language Education Council, a consortium of programs designed to train teachers to teach reading to students with reading difficulties.

[7]Lyon, G.R., Vaasen, M., & Toomey, F. (1989). Teachers' perceptions of their undergraduate and graduate preparation. *Teacher Education and Special Education, 12,* 164-169.

[8]One outstanding example is the University of Virginia's McGuffey Reading Center, which has required all teachers to pass a "word study" course, and which has never abandoned recognition of the interplay between word recognition and comprehension.

[9]Moats, L.C. (1995). The missing foundation in teacher preparation. *American Educator, 19,* 9, 43-51.

[10]Moats, L.C., & Lyon, G.R. (1996). Wanted: Teachers with knowledge of language. *Topics in Language Disorders, 16,* 73-81.

[11]Sacramento County Office of Education (1997). *A Blueprint for the Professional Development of Teachers of Reading.* Sacramento, CA.

[12]A prime example of a pervasive idea in reading education that does not hold up under critical examination is that of the "three cueing systems." See Adams, M. J. (1998). in F. Lehr and J. Osborn (Eds.) *Literacy for All.* NY: Guilford Press.

[13]Lyon, G.R., & Moats, L.C. (1997). Critical conceptual and methodological considerations in reading intervention research. *Journal of Learning Disabilities, 30,* 578-588.

[14]Snow, Burns, & Griffin; Fletcher, J., & Lyon, G.R. (1998). Reading: A research-based approach. In W. Evers (Ed.) *What's Wrong in America's Classrooms.* Stanford, CA: Hoover Institution Press, pp. 49-90; Fletcher, J., & Lyon, G.R. (1998). *Every child reading. An action plan of the Learning First Alliance: Informed instruction for reading success,* a position paper of the International Dyslexia Association; Adams, M.J. (1990). *Beginning To Read: Thinking and Learning about Print.* Cambridge, MA: MIT Press, 1990.

[15]Advanced institutes for instructional leadership in reading education might be established in our most prestigious universities and modeled after Harvard's summer institutes for school principals.

Preventing Reading Failure by Ensuring Effective Reading Instruction

by Barbara R. Foorman, Jack M. Fletcher, and David J. Francis

Is there really a reading crisis to justify the vigorous national, state, and local initiatives to address reading instruction? Consider these facts:

- Over 40% of fourth graders performed below basic on the National Assessment of Educational Progress (NAEP), that is, they did not demonstrate understanding of fourth-grade level texts.
- 10% of fourth graders did not participate in the NAEP because they could not read well enough to take it.
- According to longitudinal, population-based data, 17% to 21% of children have a reading disability.

And few would disagree with the prediction that the gap between the U.S. workforce's current literacy levels and the level required by technological advances will increase dramatically in the next decade.

> *For children from low-print environments, every minute of effective reading instruction in school counts.*

The real crisis revealed in these statistics is the disproportionate representation by minority children. In the NAEP data just presented, the percentages of African-American and Hispanic fourth graders reading below the basic level were 69% and 64%, respectively. Nationwide, these percentages translate into approximately 4.5 million African-American and 3.3 million Hispanic students reading very poorly in grade 4.[1] Not to be alarmed by these numbers is to abrogate responsibility for public education's role in providing the most basic skill of all—the skill of learning to read so that one can read to learn. For children from low-print environments, every minute of effective

reading instruction in school counts. But what constitutes "effective" reading instruction in this era of bitterly fought reading wars over phonics and whole language instruction? We will address this question in a Question and Answer format. Then we will propose a rapprochement between the extremists in the whole language and phonics camps so that we can indeed provide a "nation of readers."

Effective Reading Instruction

Q: What is effective early reading instruction?

A: Effective early reading instruction is instruction that promotes reading success, specifically success in identifying words and understanding text.

Q: Is phonics or whole language more effective in teaching children to read?

A: It is not a question of either phonics or whole language. Both play an important role in helping children learn to read.

Q: But how can you have both phonics and whole language? Doesn't phonics stress the rules for relating letters to sounds, while whole language stresses the process of extracting meaning from written language? Aren't these views incompatible because one emphasizes going from part to whole and the other emphasizes going from whole to part?

A: Yes. Phonics and whole language approaches are incompatible when viewed as exclusive instructional approaches to beginning reading. That is why advocates of both approaches to beginning reading need to look at research on how children learn to read.

Q: How do children learn to read? Isn't learning to read much like learning to talk? That is, doesn't reading emerge naturally out of interaction with parents and other adults in a print-rich environment, just as language emerges naturally out of interaction with parents and other adults?

A: No. There are important differences between learning to read and learning to talk. Learning to talk is natural, in that children grow up learning to talk like the adults around them without someone trying to teach them to talk. Reading, on the other hand, requires explicit instruction, and that is why there are cultures with spoken but no written languages.

Q: So what needs to be explicitly taught so that children learn to read?

A: An early necessary step for children is to become aware of the sounds of language—of the words within sentences, of the syllables within words, and of the units within syllables called phonemes.

Q: Why are phonemes important?

A: They are important because they are the segments of sounds that the letters of the alphabet represent. For example cat has three phonemes—/c/, /a/, and /t/—and these three phonemes are represented by the letters c, a, and t.

Q: Is that why it is important to teach children the ABC's?

A: Yes. Knowing the names and sounds of the letters of the alphabet, along with awareness of phonemes in spoken language, are the skills most predictive of reading success.

Q: Does this mean that children in kindergarten and grade 1 can be taught phonemic awareness and alphabetic skills and consequently become successful readers?

A: Yes. For the majority of children that is the case. Above all, children need the opportunity to apply their phonological and alphabetic skills to the reading of connected text.

Q: But doesn't English contain many irregular words that must be memorized?

A: Approximately 13% of English words are highly unpredictable in their letter-sound relations, such as the au in the word laugh. In contrast, 50% of words are very predictable. The remaining 37% consist of complex spelling that can be taught (as the au in taught and caught is likely to be introduced).

Q: So is this where phonics comes in—with the 50% of words that are predictable and the 37% of words with complex spelling patterns?

A: Yes. Phonics rules are letter-sound correspondence rules. The names and sounds of the alphabet are phonics rules. Beyond the single letter-sound correspondences for consonants and vowels, phonics instruction typically covers long vowel correspondences such as ay and "magic -e for long a," digraphs such as sh in ship, initial consonant blends such as sl in slap, and final consonant digraphs such as ck in back.

Q: But I've heard that it would take over 2,000 phonics rules to program a computer to read English. Having children memorize lists of phonics rules would stifle the joy of reading, wouldn't it?

A: Research indicates that programs focusing on the most

frequent spelling patterns for the approximately 44 phonemes of English can bring children at risk for reading failure up to the national average in decoding words.

Q: But won't good phonics programs simply create good decoders—"word callers"—and not good comprehenders?

A: Remember, good reading programs are not simply phonics programs. Good reading programs allow children to practice the letter-sound correspondences taught in decodable text and in good literature. In addition, good programs and teachers enable children to develop efficient word recognition strategies so that attention and memory resources are more available for comprehension. Good reading programs always provide access to good literature and encourage children to read material with which they are comfortable as much as possible.

Q: There's so much jargon in education. Now you're switching from "decoding" to "word recognition strategies." Are these the same thing?

A: In a strict sense, the word "decoding" emphasizes the letter-to-sound rules that even skilled readers use when they come to an unknown word (e.g., cacaphony). "Word recognition," on the other hand, is a term that emphasizes the role of groups of letters (e.g., eight has the "long a" sound) or meaningful units such as prefixes, suffixes, and inflectional endings (e.g., plural, past tense).

Q: Isn't that really spelling instruction?

A: Yes. Traditionally it is through spelling instruction that students go beyond phonics to learn about word meaning and writing conventions, such as that q is always followed by u, and when to double the final consonant when adding inflections (e.g., running versus writing). Spelling skill is not only relevant to writing; it is also important to the rapid recognition of words required for comprehension.

Q: What about vocabulary? Isn't it important to reading and spelling?

A: Absolutely. It's hard to read or spell a word when you don't know its meaning. And vocabulary needs to be taught, along with listening comprehension, right from the beginning of school.

Q: What about comprehension?

A: The goal of learning to read is to understand printed material. Efficient word recognition skills are a necessary but not sufficient

component of good comprehension. As children get older, comprehension strategies should be taught. From an early age, children need to enjoy reading, which can be facilitated by shared and guided reading, discussions of literature, and other practices that help children appreciate reading as a tool for understanding and learning.

Q: But what about the most important part of learning to read—the teacher?

A: Parents and teachers are crucially important to a child's success in learning to read. Teacher training needs to provide generic information about how children learn to read and spell and how to use instructional materials effectively.

Q: Should classroom teachers know how to identify and teach children with dyslexia to read?

A: Classroom teachers need to determine whether children are learning the reading skills being taught. For children who fall behind in those skills, additional help by a teacher or tutor may be necessary.

Q: Is there a particular tutorial approach that works best?

A: Research supports the benefit of thirty minutes of daily one-to-one tutoring by a tutor knowledgeable in the components of learning to read—phonemic awareness, alphabetic decoding, word recognition strategies, spelling, and comprehension. The best programs provide ample opportunities to read and discuss literature.

Q: But doesn't intervention need to be tailored to the learning styles of children?

A: People mean a lot of different things by "learning styles." Instead, the focus should be on learner characteristics that predict reading success. For example, beginning levels of phonemic awareness, vocabulary, and reading skills will determine how to intervene and for how long.

Q: Can <u>all</u> children learn to read?

A: All but a very small percentage of children can become successful readers and writers if we deliver <u>effective</u> reading instruction right from the start.

Confusion of Process with Product

So why is there so much conflict about beginning reading instruction if learning to read fundamentally involves phonemic awareness,

the alphabetic principle, and fluent decoding? When these become automatic, memory is then freed to construct the author's message. According to the "simple view of reading," reading comprehension is the product of decoding and listening comprehension skills. Word recognition and language comprehension skills are both crucially important to the process of learning to read. Who could disagree?

Disagreement—actually, misunderstanding—comes from educators and policy makers who translate discussions regarding processes of learning to read into products that demonstrate reading mastery. Thus, if researchers point to the importance in reading comprehension of skills in phonemic awareness, decoding, and spelling in learning to read, then educators conclude that instruction should focus first on phonemic awareness, then on alphabetic coding through decodable books of phonetically regular words, and, finally, on spelling of all orthographic patterns.

Instructional Materials

Such bottom-up, discrete skill instruction leads to production of separate commercial kits. Many of the basal series in the late 1990's are the literature-based programs of the early 1990's with add-on kits, but with little guidance to teachers as to how to integrate these kits into the selection of literature. Thus, the basals become unwieldy and the decision of what skills to integrate into the literature, how to integrate them, and for how long are left up to the teacher. Given such a smorgasbord of literacy and skill-based activities, it is not surprising that time spent on actual literacy instruction is limited.[1] Furthermore, given the reality of one teacher and 25 or so children in the primary grades and the taboos against "ability" grouping and Round Robin reading, it is not surprising that the basals assume whole-class instruction. Finally, given that the design of the curriculum is orchestrated by individual teachers teaching whole classrooms of students, it is not surprising that curriculum-based assessment of individual children is not characteristic of current basals. A common expectation is that teachers will master techniques for "kid-watching" and for analyzing reading errors in real books (referred to as "running records" or "miscue analysis") and individualize instruction as needed. The reality is that these "best practices" are exhibited by a relatively small proportion of the nation's teachers who have had highly specialized master's-

level training in diagnostic techniques. Unfortunately, these diagnostic techniques are available only in expensive one-on-one tutorials after the student has fallen behind in reading. Training classroom teachers in these diagnostic techniques requires massive amounts of staff development and complex interpretation of how analyses of reading errors relate to the next day's lesson plan.

Stop! How has our discussion of effective reading instruction that prevents reading failure disintegrated into a lament about poor products that evoke bad practice? The answer is that the research on how children learn to read has been largely ignored or misapplied by developers of commercial curriculum programs. For example, key to the phonological awareness training programs developed by researchers[7] is the idea of manipulating syllables and phonemes "in speech." But speech sounds—being auditory stimuli—have no place in a pupil edition, and so they are omitted or changed into picture or letter-writing worksheets. Phonics instruction, often accomplished by researchers through word-building activities[8] that require manipulation of a subset of vowels and consonants, becomes translated into worksheets. And spelling research that lays out the organizing principles of English orthography[9,10] is translated into endless spelling lists.

> *The research on how children learn to read has been largely ignored or misapplied by developers of commercial curriculum programs.*

So, what's the solution? Forget doing research so that vendors won't distort research findings into commercial profit? No, particularly since there is an extraordinarily rich body of data on how children learn to read.[11] The answer is to support accurate translation of research to practice and to support empirical tests of efficacy, where the multi-way interactions of processes and products are addressed by asking: Which students need what, when, for how long, with what type of instruction, and in what type of setting?

The good news is that there are classroom reading programs with sound pedagogy that have been shown to be effective in the

classroom. Prominent examples are Success for All,[14] Open Court Reading,[15,16] and SRA Reading Mastery.[17,18] The latter has added a literature component, so that all three of these programs can be described as balanced and comprehensive. Many more programs are currently being developed, but they too will need to withstand the test of efficacy.

Rapprochement

It is clearly possible for research on how children learn to read to inform instructional practice and curriculum products. How many times have we heard the comment, "But these approaches work only for learning disabled (LD), at-risk (Title 1), or English-as-a-Second-Language (ESL) students." Conceptually sound and empirically-based instructional approaches work for all children. However, some children will need more opportunities to practice what they are taught. All children benefit from instruction rich in oral and written language activities. All children benefit from listening to intellectually challenging text and reading from text at their instructional and independent level. All pre-readers will benefit from attending to and

> *The time to assist children is before they accumulate sufficient failure to qualify for special services or retention. This is every teacher's job — indeed, every educator's job.*

manipulating sound units in oral language and then writing down graphic representations for these sound units through phonetic spellings. All beginning readers will benefit from reading decodable and meaningful texts, along with other books that may be narratives or expository text, poetry, or fairy tales. All beginning writers will benefit from information about the orthographic principles of English spelling.

Teachers of regular education and teachers of special education, Title 1, and ESL need to unite forces and work toward preventing

reading difficulties. Reading problems after age 8 are refractory to treatment.[19,20] The time to assist children is before they accumulate sufficient failure to qualify for special services or retention. This is every teacher's job—indeed, every educator's job. There can be rapprochement between whole language and phonics extremists summed up in one word: prevention. Most reading problems can be prevented through effective classroom instruction in kindergarten and early elementary school. The key is to translate and implement what we know from research into the classroom.[1]

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Comprehension: The Sine Qua Non of Reading

by Isabel L. Beck and Margaret G. McKeown

Reading comprehension is not a simple process. Rather, it is a complex process composed of a number of interacting subprocesses and abilities. Successful comprehension of what is read requires decoding accuracy and fluency, access to meanings of the vocabulary used and to background knowledge relevant to the content, and active engagement with the text. The importance of decoding accuracy and fluency has been developed in other articles in this publication. This article deals with how knowledge of the world and active engagement with the ideas in a text influence comprehension, and how both those important capabilities can be developed.

The Power of Background Knowledge

Reading is not a subject matter in the same way that mathematics and history are, but is a *process* applied to the universe of subject matters. As such, consider that it is possible to be an excellent reader of history but a poor reader of economics. Reading is not content free; readers read *about* something, and the content of that something makes a big difference in how well it is understood.

Reading is not content free; readers read about something.

At a general level, the notion that what one already knows — background knowledge — helps one to understand and learn new information is a fairly obvious one. Discovering the details of the effects of knowledge and the mechanisms by which its influence is felt has been a focus of research over the past two decades. And it seems that the powerful effects of knowledge become more compelling the deeper the investigations go.

The amount and quality of an individual's knowledge influence each phase of gaining and using subsequent information. A reader's background knowledge affects how his attention is directed, how incoming information is interpreted, how it is stored in memory, and the ease with which it can be made available from memory. One's

prior knowledge also influences how well that newly acquired information can then be used. For example, high-knowledge individuals are able to recall more of the important information from a text they have read than low-knowledge individuals. Similarly, they can make more efficient use of time spent learning and studying.

A description of two particularly illustrative studies exemplifies the discovery of the effects of background knowledge. In a set of now classic studies, Voss and his associates analyzed the comprehension of text by adults with high and low knowledge in a specific content area – baseball.[1] Subjects were presented a passage about a baseball game and then asked to recall the text. Not only did the high-knowledge group recall more text information, but there were differences in the quality of what they recalled as well. High-knowledge readers were more likely to recall information of greater significance to the game, whereas low-knowledge readers were more likely to recall information about peripheral matters such as the weather.

A study by Pearson, Hansen, and Gordon involved two groups of second-grade children who were alike on IQ and achievement test scores, but differed in their knowledge about spiders.[2] After reading a passage about spiders, the children were asked both explicit and implicit questions. The high-knowledge group of children performed significantly better overall, a difference due mainly to their ability to answer the implicit questions. Thus in the works of both Voss and Pearson, high-knowledge readers comprehended not only more of the text but also different aspects of text information, compared to readers with less knowledge of the content. An important point to note in the Voss and Pearson work is that all subjects in the studies had some knowledge about the content being investigated – high-knowledge readers were not being compared to readers with no knowledge of the topic.

The key to the powerful workings of knowledge is its organization. As learners learn more about a domain, they develop a mental organization that facilitates availability and use of the knowledge. Ideas are tied into other ideas and form a network of relationships. As new ideas are added, the relationships get stronger and more elaborated. When information is encountered in a text, the richer the networks, the more easily the new information can be fit into them and thus retained in memory. The relationships also help make the new knowledge useful. If it is related to other known ideas, it can be made meaningful.

The view of knowledge as networks of related ideas is the foundation of a theoretical perspective on knowledge organization that hypothesizes "schemata"—abstract knowledge structures that provide frameworks for related concepts. The notion of schemata helps to explain a mechanism by which ideas are put together to become meaningful, and thus how knowledge affects reading comprehension. For example, if a reader is presented with a text about going on vacation, he or she would likely call up a vacation schema, a mental structure that has various "slots" for concepts related to going on vacation, such as packing, transportation to the vacation spot, relaxing, sightseeing, and so on. Text statements about folding clothes or carrying bags could then fill the "suitcase-packing slot." If a reader did not have a vacation schema with a suitcase-packing slot, information about clothes and bags might not be readily understood.

Both the theoretical evidence of schemata and experimental evidence from studies, such as those by Voss and Pearson and their colleagues, make clear that the extent and quality of knowledge determine how well a text is comprehended. Consequently, enriching students' knowledge is a key to enhancing their comprehension of text. Underscoring the importance of the role of knowledge that has come to light with current research, Glaser and DeCorte note that the assessment of prior knowledge is a much more precise indicator of learning than traditional measures of aptitude, and that assessment of prior knowledge also provides a more effective basis for guiding instruction.

Building Children's Base of Knowledge and Experience

How is knowledge of the world acquired? Children need opportunities to encounter information and link ideas. These opportunities can come through direct experiences with the world or through vicarious experiences, with reading chief among them. Admittedly, this solution sounds rather circular: Reading improves if you acquire knowledge so that you may be in a position to acquire more knowledge to improve your reading. So we need to find an access point into that circle to ensure that experiences with new ideas lead to understanding and the building of the kind of linking relationships that characterize productive knowledge – knowledge that undergirds further learning.

The value of experience is the extent to which it becomes part of one's knowledge base, whether links are built. Thus, it is important that children do not take text at face value as they read, but that they learn to consider, reflect, and explore the ideas so that they come to own them. Considering, reflecting, and exploring as one reads comprises active engagement with text. How can we promote students' active engagement with text?

Word Recognition

A stumbling block to children's early acquisition of knowledge through reading is that in the early phases of reading instruction, children's word recognition abilities are limited. The kinds of stories children can read on their own in the early phases do not typically offer the kinds of new and complex concepts needed to develop and enrich children's knowledge bases. Yet, children are cognitively able to comprehend sophisticated material through listening. Young children's aural comprehension and conceptual abilities outstrip their competence at word recognition.

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Recognition of children's conceptual abilities is one underlying motivation for literature-based approaches to early reading instruction. The intent of literature-based approaches is to provide texts and tasks that are rich in ideas from the very start of the learning-to-read process. Yet, even when selections from good children's literature form the basis for the reading program, the selections cannot provide the best kind of grist for developing knowledge and encouraging thinking. Selections that provide new ideas and are written in language sophisticated enough to provide conceptual challenge are likely to be beyond the word recognition level of most beginning readers.

Emphatically, however, this does not mean that the development of sophisticated content and the application of higher processes should be put on hold, but rather that useful world knowledge and higher

order cognitive activity cannot be best developed through young childrens' reading on their own. Instruction needs to take advantage of children's aural competence to enhance their conceptual development, rather than holding it back until their word recognition becomes adequate. Challenging content can be presented to young children from book selections that are read aloud. And because reading and listening build upon a common knowledge base, instruction aimed at developing students' oral language competence can serve as a means to enhancing their reading competence.[1]

Reading Aloud and Discussing Literature with Children

Reading aloud to children is an activity that has been pursued at home and in schools for centuries. There are indications that its effects are significant for children's literacy growth. Most obviously, listening to books being read directly adds to children's knowledge and vocabulary. But what researchers suggest may be even more important is the experience it gives children with decontextualized language, making sense of ideas that are about something beyond the here and now.[2]

The key to experiences with decontextualized language that makes them valuable for future literacy seems to lie in not merely listening to literary language, but in talking about the ideas. Participating in decontextualized language, forming ideas about what was in a book, and expressing them in ways that make sense to others are the ingredients for building competence in communication. Snow has pointed out that quality talk around books can promote "[familiarity with] relatively rare vocabulary, understanding the lexical and grammatical strategies for adjusting to a nonpresent audience, identifying the perspective of the listener so as to provide sufficient background information, and knowing the genre specific rules for various forms of talk such as narrative and explanation."[3]

There is abundant evidence that preschool children's participation in talk around book reading enhances the growth of children's literacy skills. Further evidence for the role of talking about books comes from studies by Morrow and Freppon, both of whom compared literature-oriented and skills-oriented classrooms. In each study, the

researchers concluded that "talk surrounding the text" and "getting children to think about what was going on in the story" were key to literacy growth.

However, as anyone who has talked with young children about books or watched such discussions in classrooms knows, the quality of this talk can be wide-ranging. Researchers who have explored teachers' experience with reading aloud in classrooms have noted a variety of styles, which have differential effects on children's understanding.

D.K. Dickinson and M.W. Smith, reporting about their research in *Reading Research Quarterly in 1994*, found that the most productive interactions were those that occurred as the story was read, that involved both children and teachers, and in which the talk was analytic in nature, that is, that required children to reflect on the story content or language. W.H. Teale and M.G. Martinez, writing in *Children's Early Text Construction* in 1996, described the read-aloud styles of six teachers and found that the style of one teacher led to children's better story retelling. Her read-aloud style was characterized by drawing attention to important story information both before and after the story and as each episode was read, and in eliciting responses from the children about the story episodes. Teale and Martinez went on to point out some features of teachers' styles that may have interfered with comprehension, such as allowing children to stray well beyond the story line or circumscribing the situation to allow only brief, literal responses, with the teacher quickly supplying answers if children hesitated.

Dickinson and Smith's and Teale and Martinez's ideas about the most effective read-aloud strategies seem quite consistent. The most effective features seem to include focusing the discussion on major story ideas, dealing with ideas as they are encountered rather than after the entire story has been read, and involving children in the discussion with opportunities to be reflective rather than expecting a quickly retrieved answer.

The Role of Vocabulary in Literacy Growth

One measure of literacy growth that Dickinson and Snow have used in their studies of young children is vocabulary growth. Vocabulary is indicative of an individual's knowledge and literacy. There is, in fact, a strong, well-documented relationship between

vocabulary and school achievement in general and reading proficiency in particular.[10] Thus, an important aspect of developing children's knowledge involves enhancing their facility to understand and use words. Growth of vocabulary has been a long-standing research focus, and what is known is that most vocabulary must be acquired from encountering it in context – both oral and written. However, research also shows that acquiring vocabulary from context is not a simple task.[11] Acquiring vocabulary from context seems to be built on multiple encounters with a word and large numbers of opportunities to develop a sense of how to use context to take advantage of information offered.

A major finding from an extensive program of vocabulary research is that building children's ability to use words effectively – not just knowing their definitions – requires engaging children in *thinking* about words and applying them to different situations.[12] Vocabulary, as a special aspect of one's background knowledge, is organized as networks of related meanings. In facilitating children's vocabulary knowledge, the goal is to help them build rich and connected understandings. Consider the difference in learning that a *miser* is someone who is stingy with money versus coming to understand how a *miser* might act in different situations, the consequences of being a *miser*, and how *miser* might relate to other words such as *philanthropist, greedy*, or *frugal*. The former, definitional type of knowledge is static and allows little flexibility. The latter, however, allows the learner to use the word in a range of applications as well as potentially to understand it in a variety of contexts in which the word, or words related to it, might be found.

Besides directly adding items to children's vocabulary, enhancing children's ability to know and use words increases their capacity for knowing how to use context to learn about words, dealing with figurative language, and learning about word parts and how to use them in understanding meanings. Yet another, less tangible aspect of vocabulary knowledge is an awareness of words — recognizing and learning about novel words and noticing variations in the uses of words in one's language environment. There is some limited evidence from the work of Beck and McKeown and their colleagues that providing the kind of instruction that requires students to think about words, inspect them for interesting features, and "play" with word meanings enables students to learn words beyond those directly taught. The explanation

for this learning again relates to networks of knowledge. That is, in encountering new words, students who learn vocabulary in rich ways may have an elaborated set of connected ideas that relate to the context in which a new word may be found. Thus the new word has, in essence, a ready place in the knowledge repertoire into which it can fit.

It is essential that attempts to influence children's vocabulary growth begin early in the course of their literacy development. Although most vocabulary is learned from context, it is necessary to provide direct vocabulary experiences, given the huge individual differences among students in vocabulary size. In particular, there is an enormous discrepancy between high- and low-achieving learners. For example, in 1941 M.K. Smith reported in *Genetic Psychological Monographs* that high school seniors near the top of the distribution knew about four times as many words as their classmates at the bottom of the distribution. Even more remarkably, higher-performing third graders had vocabularies about equal to lowest-performing twelfth graders. More recently, M.F. Graves and his colleagues found that the vocabulary of upper socioeconomic status (SES) first graders was about twice the size of their lower SES peers.[1] Thus, the need for vocabulary intervention, especially for children who do not experience rich language environments at home, is clear.

Active Engagement in Independent Reading

Now, let us consider some ingredients of successful comprehension for children in the intermediate grades who are reading independently. A frequent problem that has been identified with students at this level is that the manner in which they read does not reflect what is now understood about effective reading. That is, reading is a constructive endeavor in which readers need to actively make sense of text information by putting ideas together and weaving them into what they already know. Yet, students often exhibit a lack of active engagement with what they read. It is as if the words roll by with little more than their outward forms registering. Attempts at grappling with the words and their underlying ideas to build meaning may be feeble. Research with students and their interactions with texts has shown that younger and less adept readers tend to take a less than active role in the reading process. Inexperienced readers are less

likely to monitor what they understand from their reading or to employ strategies to keep their reading on track.

Recent studies of reading comprehension have focused on developing instructional techniques to encourage students to become actively involved in reading. One direction has been to encourage students to actively respond to what they read through collaborative discussion in which they share and challenge each others' ideas. Several curricular projects in collaborative discussion have been developed, such as the Reflective Thinking Project, the Book Club Project, the Conversational Discussion Groups Project, and the Junior Great Books reading and discussion program.[1] The discussion format seems to increase student involvement with literature. Yet, it is important to note that these discussions take place after reading, and thus, the ongoing process of constructing meaning as text is initially read is not addressed.

A technique for more directly promoting reading as an active search for meaning is self-explanation, in which students are directed to provide explanations for presented information.[2] Researchers have found that self-explanations can be elicited from students, and that when they are, students are better able to learn the material presented to them.

Questioning the Author

The significance of an active search for meaning became clear to us in our work with social studies textbooks for intermediate-grades students.[3] Having found that textbooks lacked features to make them useful learning tools for young students, we undertook studies to create revised, more comprehensible versions.[4] Our work in revising the texts made us aware that the process of creating more comprehensible text material required our active engagement with its contents and grappling with ideas in order to understand what the author was trying to say.

The insight about our own processing made us consider how we might promote young students' active engagement with text by encouraging them to grapple with text ideas in order to figure out what an author was trying to say. These notions led to the development of an instructional intervention called "Questioning the Author." The focus of "Questioning the Author" is to approach text as the

product of a fallible author —"just someone's ideas written down"— and to have students grapple with what the author has written in order to build meaning from it. This is accomplished by having students consider segments of text as it is initially read and respond to teacher-posed queries, such as, "What is the author trying to say?" and "What do you think the author means by that?" The queries are designed to invite students to explore the meaning of text ideas and to initiate discussion among themselves as they connect with each others' responses and build meaning together.

Work in classrooms with fourteen teachers over six years has shown that "Questioning the Author" results in more productive discourse in the classroom, with both teachers and students responding to text in more meaningful ways, rather than focusing on the literal text language.[9]

Final Thoughts

To help children gain success with reading, it is necessary to focus on comprehension early in their experiences. Focus on comprehension needs to include not merely understanding simple stories that can be read independently, but challenging children with more sophisticated ideas and encouraging them to manipulate and respond to the ideas. More importantly, much of this interaction can and should be done aurally; it can't wait for children's word skills to catch up with their conceptual skills.

Building children's facility with text means enhancing aspects beyond text, in particular enriching general knowledge and vocabulary skill. Further, students need to actively engage their abilities as they read; merely gazing at texts is not helpful to build reading skill or understanding. Children need to bring what they know to bear on a text, formulate what they encounter, and apply that understanding to subsequent reading. Being a skilled comprehender means fully engaging in the comprehension process and carrying the results of that comprehension into future interactions with text.

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Follow-up Actions: What Can I Do to Unlock the Keys to Literacy?

Superintendents and School Board Members

Do I understand what the components of good reading instruction are?
Have I made the teaching of reading central to my district's academic plan?
Have I required that all reading teachers receive necessary training in reading instruction?
Have I put into place training to enable teachers to identify reading disabled children?
Do I have assessments in place to provide good information on students' reading skills?

Principals

Do I understand what good diagnostic assessment of students' reading abilities is?
Am I able to judge whether or not a teacher is an effective reading instructor?
Have I scheduled sufficient time for the teaching of reading?

Teachers

Do I understand that reading, unlike talking, requires explicit instruction?
Do I understand how children learn to read?
Am I aware of the importance of teaching children the sounds of the language?
Am I familiar with effective reading programs?
Have I received appropriate training in the teaching of reading?

Parents

Do I understand the components of good reading instruction?
Am I aware of the benefits of reading aloud and discussing literature with children?
Do I receive good information from the school on my children's reading abilities and needs?
How can I make my community aware of solutions to the reading crisis?

Authors' Biographies

Isabel L. Beck is professor of education in the School of Education and senior scientist at the Learning Research and Development Center, both at the University of Pittsburgh. After teaching in the public schools, she received a Ph.D. in 1973. Her research interests have focused on the acquisition of decoding skills, learning from text, and the development of tactics for enhancing students' abilities to learn from difficult texts. In 1988, she received the Oscar S. Causey award for outstanding reading research from the National Reading Conference, and in 1995 she was inducted into the International Reading Association's "Reading Hall of Fame."

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David J. Francis is a professor of quantitative methods in the Department of Psychology at the University of Houston and an associate at the Center for Academic and Reading Skills. He obtained a

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G. Reid Lyon is a research psychologist and chief of the Child Development and Behavior Branch of the National Institute of Child Health and Human Development (NICHD) at the National Institutes of Health. He is responsible for the direction of research programs in reading development and disorders, learning disabilities, language disorders, and disorders of attention. Prior to joining the NIH on a full-time basis in 1991, Dr. Lyon served as an associate professor of neurology at the University of Vermont from 1983 to 1991. He has authored, co-authored, and edited more than 85 journal articles, books, and book chapters and has conducted extensive research on how children learn to read.

Margaret G. McKeown is a research scientist at the Learning Research and Development Center at the University of Pittsburgh, where she applies theory and cognitive research to practical, current problems that classroom teachers and their students face. Her work covers the areas of instructional design and teacher professional development in social studies, reading comprehension, and vocabulary. She earned a Ph.D. in education from the University of Pittsburgh in 1983 and has published extensively in both professional and practitioner books and journals. Before undertaking her career in research, Dr. McKeown taught reading and language arts in elementary school.

Louisa C. Moats is the director of the Early Interventions Project in the District of Columbia Public Schools and the Houston, Texas, Independent School District. She received her doctorate in Reading and Human Development from the Harvard University Graduate School of Education. She spent the 1996-97 school year as the

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